DOCUMENT RESUME

ED 256 692 SO 016 436

AUTHOR Mische, Patricia M.
TITLE Star Wars and the State of Our Souls. Special Issue. The Whole Earth Papers, No. 20.
PUB DATE 84
NOTE 84p.
AVAILABLE FROM Global Education Associates, 552 Park Ave., East Orange, NJ 07017 ($2.50; bulk rates available).
PUB TYPE Viewpoints (120)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS *Disarmament; Foreign Policy; National Security; *Nuclear Warfare; *Peace
IDENTIFIERS Nuclear Deterrence; Nuclear Freeze; Nuclear Weapons; *Outer Space; *Star Wars

ABSTRACT

These two essays are intended to make U.S. citizens think about what they are doing, to put contemplation before action when considering the "Star Wars" proposals, i.e., proposals for research, development, and testing of space weapons. It is emphasized that the "Star Wars" proposals offer no real breakthroughs in strengthening national security or world security. The first essay, "Star Wars and the State of Our Souls," discusses the weaponization of space, space dedicated to peace, preparing for star wars, types of space weapons, how weapons determine policy, arguments of proponents and opponents of "Star Wars," the real objectives of "Star Wars," the need for people to really think about what "Star Wars" would mean, and the benefits of a ban on space weapons. The second essay, "Space Weapons: A Workable Defense Or a Faustian Bargain?" describes and assesses anti-satellite weapons and "Star Wars" technology and proposes a ban on space weapons. The publication concludes with a "Proposal for a Deep Freeze" by Robert M. Bowman. (RM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED256692

STAR WARS AND THE STATE OF OUR SOULS.

2 ESSAYS BY PATRICIA M. MISCHE

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Harriett Zullo

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

SO 016 436

STAR WARS AND THE STATE OF OUR SOULS

Space is being looked at by some as the new frontier — "the high frontier" — for warfare. We must not let that happen. We must preserve space as the first frontier for peace.

This book is dedicated to those whose foresight and commitment gave us the Outer Space Treaty. In it the world's nations pledged themselves to preserve space for peaceful uses. May we be faithful to that pledge. Let us not diminish their legacy. Let us enlarge it.

P.M. Mische

STAR WARS AND THE STATE OF OUR SOULS

by Patricia M. Mische

The Whole Earth Papers
Global Education Associates
552 Park Avenue
East Orange, NJ 07017

The Whole Earth Papers

Published by
Global Education Associates
552 Park Avenue
East Orange, NJ 07017, USA

No. 20, *Star Wars and the State of Our Souls*, is adapted from chapters in a forthcoming book on Security Alternatives, by Patricia M. Mische.

© Copyright, 1984, by Patricia M. Mische

Cover Design by Charles Tomashek

Printed by W & C Printing Co., Winona, Minnesota.

No part of this volume may be reproduced in any form without permission from the author, except for quotation of brief passages in reviews.

Acknowledgements

Special credit and appreciation is given to Dr. Robert Bowman and the Institute for Space and Security Studies for permission to reprint in this volume Dr. Bowman's proposals for a Deep Freeze and to quote from other ISSS issue papers. Special appreciation is also given to Dr. Bowman and to Dr. Rosalie Bertell for their critical reviews of an earlier draft of this paper. At the same time they are not responsible for any errors that may be found herein. Appreciation also to the Union of Concerned Scientists for the consistently excellent and helpful materials they have published on this topic. Special appreciation also to the Franciscan Sisters of Rochester, Minnesota, and The College of Saint Teresa for their support during our period as Visiting Scholars at the college, when the research and writing on this volume were done.

CONTENTS

Preface i

Star Wars and the State of Our Souls 1

Space Weapons: A Workable Defense
Or a Faustian Bargain? 39
(A description and assessment of ASAT and
"Star Wars" technology, with proposals
for a ban on space weapons)

Proposal For A Deep Freeze
by Dr. Robert Bowman 67

PREFACE

"Star Wars" proposals — i.e., proposals for research, development and testing of space weapons - are more than they appear on the surface. On the surface there is the word "defense." "Star Wars" proposals are said to offer a "defense" against a ballistic missile attack. "Defense" is more comforting - and seductive -than a phrase like "Mutual Assured Destruction." On the surface also is the excitement of bringing forth a new technology, of making science fiction a reality, of *doing* the impossible. There is something in the human spirit that wants and needs to transcend limits. Indeed the story of progress and growth, and the story of human development, is the story of human beings breaking through their past limitations - whether these limitations are physical, emotional, mental, technological, aesthetic or spiritual.

But should we always *do* what becomes techologically possible? The tragedy is that in a Faustian fascination with *doing* what becomes technologically possible, we may sell our souls. We may bargain away our nations, our world, the future of our grandchildren, and indeed, the future of the earth. The real challenge of growth at the advent of any new technology is not whether we can obtain the know-how to develop it, but whether we should *choose* to do so and, if so, for what purposes. As Hannah Arendt has noted, we need to "think what we are doing."

These essays are my attempt to help us "think what we are doing;" to put contemplation before action. The more research I did on "Star War" proposals, the deeper were the implications I saw. These proposals will violate existing arms control treaties. They will further destabilize US/Soviet relations. They will erode an already fragile body of international law and threaten the few international safeguards we have so painfully

developed over the last century. They will start a whole new arms race. They will threaten the peaceful uses of space, including communication and verification systems that make arms control viable. They may well abort or compromise other areas of research in outer space that could lead to more important lessons about our cosmos and our earth. And the hundreds of billions of dollars that they will cost will be devastating to the economy and to human needs. Finally, our obsession with the technology of destruction may dimish our sense of the sacred and our ability to comprehend who we are and who we can be.

These essays are not a condemnation of a new technology. Nor are they a call to restrain the human spirit from trying to transcend limits. Quite the contrary. These reflections are intended to call us to transcend the limits of our old ways of seeing and being on the earth. For the "Star Wars" proposals - despite all the hoopla around them - offer no real breakthroughs in strengthening national security or world security. They offer no real breakthroughs in enhancing human life on earth or in making our way out to the stars. They offer no real breakthroughs in solving our problems on earth, such as hunger, disease and alienation. They do not advance civilization or human development. If anything, they diminish us in all of these areas. They do this because they utilize old worldviews to make choices about the uses of new technologies.

Go out into space we must and will. But before we do so, we need to learn the most fundamental lesson taught us by space: we live on an interdependent planet, breathing together within one air system, sharing one water system and one land system. We subsist together within one space system. Our security and survival on this planet cannot be found in poising to destroy one another, whether from outer space or from earth, but only in learning to live together.

We live at a time when this is as true of security arrangements as of other aspects of life on earth. *National* security has now become synonymous with *world* security. We need to develop more appropriate security systems, but not by extending warfare out to the global commons of outer space. Rather, we need to develop more appropriate security systems on earth, based on principles of mutual survival and not mutual assured destruction, so that together we may proceed to discover the deeper mysteries that await us in outer space and in the recesses of our own being.

Pat Mische (1984)

Star Wars
And
The State
Of Our Souls

When I was born, Buck Rogers lived in comic book fantasies, but no man had yet gone to the moon. The notion of star wars seemed too remote then to generate fears among people on earth.

Thousands of years earlier, our tribal ancestors had believed that the whole earth - the land, the water, the wind, - was inhabited by sacred forces. The whole earth had belonged to the gods. But the time was World War II. By then men had penetrated, militarized and desacralized the land with tanks, bazookas, mines and poisonous gas. They had penetrated, militarized and desacralized the waters with submarines, mines and torpedoes. And with the bomber they had penetrated and militarized the skies.

Still, in those "innocent" years, while holocausts were perpetrated on earth, outer space remained sacred space. It was no-man's land. Here dwelt Orion, Taurus, Virgo, Aquarius, the Seven Sisters and other mythical beings, but not mere mortals.

Space was the last place safe from human wars. And it was the last refuge of our image of a sacred presence in the universe. When we prayed we looked heavenward, for the God of creation lived not on a militarized earth anymore but had receded in our images to the outer reaches of space. Space then was the last dwelling place of God. But it would quickly be seen by some as the new frontier - the high frontier - for militarization. Is it any coincidence then, that in the late 50's and 60's, when men began for the first time to penetrate and then to militarize space, that some began to proclaim the death of God altogether?

It has become commonplace to say that we are at a new crossroads in the arms race. Every decade of this century has brought new, more dangerous weapons systems. But we are at more than another crossroads in the arms race. We are at a crossroads in our perceptions of national security. We are at a new crossroads in our relationship with outer space. We are at a crossroads in our relationship with the earth. And we are at a crossroads in our relationship with the sacred.

Space exploration has opened the way for a new vision of the earth. The modern atomistic worldview in which more than 150 separately acting nation states compete against one another for security stands in conflict with the lessons learned in space: *There is only one air system, one water system, one land system, and one indivisible space system within which all earth societies subsist.*

Security based on territorial boundaries and divisions is appropriate only for those who still believe that the earth is flat and air divisible. But while many have begun to look to space for new approaches to security, have they been asking the right questions? Or have they simply been projecting old worldviews out to the stars.

We are at a crossroads in the arms race...(but also) in our perceptions of national security,...in our relationship with outer space and with the earth, and in our relationship with the sacred.

Weaponizing Space

The *militarization* of space is already a fact. It will be very difficult to change that, at least in the foreseeable future - quite possibly not unless or until war itself is

abolished and disarmament largely accomplished. But we can still prevent the *weaponization* of space.

There is an important distinction between the two. While the *militarization* of space is ominous as a prelude to weaponization, it has, up to now, also provided some peace benefits. The *weaponization* of space, on the other hand, takes the militarization process to a new, more dangerous level that is more likely to reap war than peace.

The militarization of space has proceeded with little public attention and almost no public protest. Yet the Institute for Space and Security Studies (ISSS)[1] reports that three-fourths of current U.S. space expenditures are for military purposes. The amount the Pentagon expends on its space activities exceeds the entire budget of NASA, which was chartered by Congress to develop the peaceful uses of space. But until recently these military purposes were relatively benign and even helpful to peace because "the emphasis was on non-weapons applications such as communications, navigation, and surveillance."[2] The ISSS report cites some of the peace benefits of these early military applications:[3]

> For the first couple of decades of the space age, military space systems were, for the most part, stability enhancing. They performed such missions as surveillance and communications which eliminated the possibility of a surprise attack and provided for the control of retaliatory forces. They also provided national technical means of verification which made arms control possible.

Weaponization, however, is another matter. The phrase "weaponization of space" was coined by Dr. Robert M. Bowman, president of the ISSS, to include the

introduction of weapons that are either (1) directed *at* space objects, whether from bases on land, sea or air or, (2) weapons, for whatever purpose, based *in* space.[4]

Bowman is a 22 year veteran of the Air Force (during which time he was director of Advanced Space Programs Development for what is now the Air Force Space Division) and a former executive with General Dynamics (manager of Advanced Space Programs) and the Space Communications Company (Vice-President). His considerable experience has convinced him that the weaponization of space would jeopardize such peace dividends in three ways: (1) by threatening satellite communication and verification systems, (2) by catapulting the US and USSR into a wholly new arms race and (3) by tempting both sides to a pre-emptive strike.

Up until now the temptation to weaponize space has been suppressed each time it was raised. One reason was the lack of the technical means to do so. Another was the resistance of world public opinion. Early on in space exploration the competition between the two superpowers, which helped spur technological advances on both sides, was tempered by pressures to preserve space for peaceful uses.

The view of the earth rising from the moon's horizon took our breaths away...It seemed for a time that this achievement, this new vision, would bring all of us on earth closer together.

In the late 1950s the Russians put the world on alert with the orbiting of Sputnik. The U.S. responded with a massive mobilization of its educational and scientific institutions. The race for space was on. A few years later in 1962, John Glenn became the first U.S. astronaut to orbit the earth. In 1969, U.S. astronauts landed on the moon

while the world watched via television. The view of the earth rising from the moon's horizon took our breaths away. It captured the public imagination. It helped us see the earth in a new way, as one, interdependent, vulnerable planet. It seemed for a time that this achievement, this new vision, would bring all of us on earth closer together.

Space Dedicated to Peace

There were great hopes for the peaceful uses of space. As early as 1959 and through 1962 the Western powers and the USSR had put forward various proposals for banning the use of outer space for military purposes as part of successive plans for general and complete disarmament, but agreement was never reached. On October 17, 1963, the UN General Assembly unanimously adopted a resolution calling upon all states to refrain from introducing weapons of mass destruction into outer space. In June, 1966, the United States and the Soviet Union both submitted draft treaties to give this resolution more substance. Differences between the two were eventually resolved and on December 19, 1966, the "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies" (more commonly referred to as the Outer Space Treaty) was approved by acclamation in the General Assembly.

The Treaty on Outer Space reaffirmed "the common interest of all mankind in the...exploration and use of outer space for peaceful purposes." Nations agreed that "the exploration and use of outer space...shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."

All States party to the treaty agreed *"not to place in orbit around the earth any nuclear weapons or any other kinds of weapons of mass destruction."* Furthermore, all signatory nations bound themselves, under terms of the

treaty, *not to establish any military bases, installations and fortifications, or to test any type of weapon or to conduct military maneuvers on celestial bodies.* They also agreed that any State party to the treaty that launched objects into outer space, or from whose territory objects were launched, would accept international liability for any damage to another State party that might result. Finally they pledged to be guided in their explorations and use of outer space by "the principle of cooperation and mutual assistance."

The Treaty on Outer Space reaffirmed...the common interest of all (hu)mankind in the...exploration and use of outer space for peaceful purposes.

The treaty was opened for signature at Washington, London and Moscow on January 27, 1967. On April 25, the U.S. Senate gave unanimous consent to its ratification. It entered into force on October 10, 1967. As of 1982, 89 nations had signed, ratified or acceded to the treaty.

With this treaty in place the world's people felt relatively secure about the peaceful uses of space. In the 17 years since its adoption, it has contributed to the peaceful space environment which made US and Soviet cooperation in space possible for a time and which has made world communication systems viable, bringing all of us around the world closer together. We could for the first time in human history, "reach out and touch someone" almost instantly anywhere else in the world. Thus, to most of us, "star wars" seemed to be something that would remain the subject of science fiction.

Preparing for Star Wars

Preparation for star wars did not begin suddenly with President Reagan. While Reagan focused media attention on it in his famous "Star Wars" speech of March 23, 1983, suggesting that the U.S. should pursue further research and development in this area, the research has, in fact, been under way for many years. And while anti-nuclear groups riveted their energies on nuclear weapons, military research was already going beyond nuclear missiles to preparations for combat in space.

The first time I became aware that space weapons had moved out of the realm of science fiction and onto the military drawing boards was in 1979 during President Carter's administration. At the time the U.S. State Department was trying to arouse public support for S.A.L.T. II and was conducting a series of citizen briefings. I had just come from one of these and was enroute from Washington D.C. to St. Louis where I was going to give a talk. Next to me on the plane was an army major who taught weapons systems for the army. He had just come from his monthly Pentagon briefings. There was a blizzard below and the plane had to circle for several hours. Free drinks were served and there was much comradery aboard.

I used the occasion to ask the major about the security implications of SALT. II. "If you ask me," he said, "SALT doesn't affect our security one way or another. We already have more nuclear weapons than we need, so putting a ceiling on the numbers doesn't have any affect on U.S. security. Besides," he continued, "I'm already teaching about new weapons not even included in the SALT negotiations: lasers, particle beams, killer satellites..."

According to the Institute for Space and Security Studies[7]

> The idea of space-based ABM systems goes

[7]

back about a quarter of a century and is as old as ballistic missiles themselves. For the last decade (the U.S. has been) spending at least a hundred million dollars a year on the development of such weapons - an amount that has increased to about a billion a year.

Types of Space Weapons

A number of types of space weapons have been undergoing research, including high energy lasers (the acronym is HEL), particle beams, microwaves, orbiting mirrors (to be used with lasers), rocket-powered kill vehicles and high velocity buckshot. Different types of high energy laser systems are being explored, including chemical powered lasers and nuclear-powered x-ray lasers. The "High Frontier" proposal that is being vigorously promoted by the Heritage Foundation is a three-tiered plan that would utilize a number of the above weapons systems. It involves both spaceborne and ground systems to "filter" missiles at different stages in their trajectory toward a target. (See accompanying article on Space Weapons.)

In a world desperately wanting an alternative to Mutual Assured Destruction, voices promising that new weapons will ensure survival and defense against a nuclear attack can be seductive.

Defense as Seduction

In a world desperately wanting an alternative to Mutual Assured Destruction, voices promising that new weapons will ensure survival and defense against a nuclear attack can be seductive - as seductive as the songs of the fabled sirens who lured ancient Greek

mariners into dangerous waters and ultimate destruction.

The extensive research he did on space programs for the Air Force, and all the research he has done since, has persuaded Dr. Bowman that despite all the alluring promises of defense, a "Star Wars" ABM system is "not in the security interest of the United States."[8]

> "All (of the proposed weapon systems) have staggering technical problems. All are likely to cost on the order of a trillion dollars to implement (give or take a few hundred billion.) All violate one or more existing treaties. All are extremely vulnerable. All are subject to a variety of countermeasures. All could be made impotent by alternative offensive missiles and therefore would be likely to reignite the numerical arms race in offensive weapons. All would (if they worked) be more effective as part of a first strike than against one. All would have offensive capabilities against opposing manned or unmanned satellites or against similar 'defensive' systems on the other side. Most importantly, all would be extremely destabilizing, probably triggering the nuclear war which both sides are trying to prevent."[9]

Defense? Or First Strike?

Bowman's conclusion that these systems have *offensive* capabilities and would be "more effective as part of a first strike than against one," needs to be deeply considered. The destruction of an opponent's strategic satellites, for instance, would make it difficult for them to detect, track, defend against or retaliate after a missile attack. It thus diminishes their ability to deter an attack and increases their vulnerability to a first strike.

The MX missile is also claimed by its proponents to be a defensive system because it is designed to destroy enemy missiles in their silos. But destroying missiles still in their silos constitutes a first strike. Is a first strike really a defensive act? Or is the word "defense" here merely a euphemism for aggression? What makes first-strike space weapons so dangerous, is that whichever side thought, rightly or wrongly, that its strategic satellite systems were in jeopardy would be tempted to undertake a pre-emptive strike. The chances of a nuclear war starting by miscalculation or accident are increased multifold.

All would...be more effective as part of a first strike than against one. (Bowman)

Weapons Determine Policy: From War Prevention to Nuclear War-Fighting

In the past it was central to U.S. military philosophy to subject weaonry to strategy.[9] The primary strategy was nuclear war *prevention*. Adherence to this policy led to the successful conclusion of the ABM Treaty in 1972. Both superpowers recognized that anti-ballistic missiles would not only be very costly and that they might not work, but more importantly, that they would fuel an *offensive* arms race that would make a first-strike more probable and increase the risk of nuclear war.[9] Similarly, military-related space systems up to now have been subject to a strategy of war prevention. They have been, says Bowman, "strictly peacetime systems, designed to support a strategy of deterrence and not survivable in a conflict situation."

But in the last few years weapons have begun to determine strategy. According to Bowman,[10] MIRVs (Multiple Independently-targetable Reentry Vehicles)

theoretically made a first strike advantageous because the multiple warheads on one missile could simultaneously strike a number of missile silos in different locations, thus minimizing the possibility of retaliation. This undercut the policy of deterrence and began a shift in strategy toward nuclear-war-fighting because it offered an advantage to the nation that struck first.

The U.S. had MIRVs first. Seduced by the lure of technological superiority the U.S. refused to include a ban on MIRVs in the 1972 SALT I Treaty. But in the absence of such a ban, it only took a few years for the Russians to develop their own MIRVs. With its own missile silos now in jeopardy, the U.S. was less secure than ever.

U.S. military leaders then announced a "window of vulnerability." The MX (Missile Experimental) was dreamed up to resolve the problem. The idea was to produce a missile system that could survive a first strike and be used in retaliation, thus, maintaining a deterrent. But the "survivability" element proved too costly and difficult to achieve. Instead of abandoning the project proponents of the system were so fascinated by other technological innovations that the MX was developed anyway, with a highly accurate guidance system that gave it a first-strike or "silo-busting" capability.

In the past it was central to U.S. military philosophy to subject weaonry to strategy...But in the last few years weapons have begun to determine strategy.

"The MX was a misfit in our deterrent strategy," says Bowman. But instead of changing the weapons to fit the strategy, "our strategy has changed to fit our weapons."[11]

11

What in effect has happened is a chain reaction in which commitment to the new first-strike weapons has led to a strategy shift from nuclear war-prevention to plans for nuclear war-fighting. This shift is now *threatening to alter space policy*. Up until now war between the superpowers has been avoided "largely because of the stabilizing influence of space systems," says Bowman.[12]

> The military surveillance systems of the United States and the Soviet Union have until now contributed immeasurably to peace by denying the element of surprise to an attacker and thus diminishing the temptation to launch a first strike. By giving each side the knowledge that they could not be taken by surprise, they have reduced the pressures for pre-emptive strikes and led to a considerable lessening of tension. Space systems provide time for analysis, confirmation, consultation, and deliberation, and have made hair-trigger responses unnecessary.

Having adopted a policy of nuclear-war-fighting, U.S. military planners were then confronted with a critical choice in space policy. Existing space systems had not been designed for war fighting, but for preventing war. The choice was either to abandon the MX and other first strike weapons and return to a war-prevention policy, or to weaponize space for the eventuality of war-fighting. In proposing that the country spend hundreds of billions of dollars to produce MX missiles and to develop space weapons, President Reagan indicated his clear choice: to prepare space - and the U.S. - for *nuclear war-fighting*.[13]

Proponents Argue Security and Morality

Those who advocate the weaponization of space include President Reagan, Dr. Edward Teller (head of the

research team that developed the hydrogen bomb), Lt. Gen. Daniel Graham (retired and now associated with The Heritage Foundation as director of "The High Frontier" project), and Dr. Lowell Wood, (a scientist at the Lawrence Livermore National Laboratory, which is involved in research on X-ray lasers). Depending on their audience, proponents may make different claims. When appealing to the currently strong anti-nuclear sentiment they argue, like President Reagan, that it is a way to render nuclear weapons "impotent and obsolete,"[14] or, like General Graham, that a space defense will "remove the brooding menace of nuclear war and end the immorality of Mutual Assured Destruction."[15]

Conversely, when appealing to anti-Soviet or "America needs a stronger defense" sentiments, proponents argue that weaponizing space will[16]

> (give the U.S.) "an opportunity to 1. slam shut the window of U.S. military vulnerability; 2. fast-thaw the nuclear freeze movement; 3. preserve America's narrowing technological lead in space; 4 greatly limit the damage from any Soviet first-strike attack."

Proponents further argue that it would make detente with the Soviet Union unnecessary and allow for the "replacement of the the deterrence strategy with a doctrine of Assured Survival."[17]

In his "Star Wars" speech President Reagan told Americans that their hope for the future depended on a system of space weapons to shoot down enemy missiles. He appealed to survival instincts and strongly implied that the weapons would protect the nation.

Edward Teller, who worked with Oppenheimer on the A-bomb and has defended nuclear weapons research and development ever since, now wants the U.S. to go beyond the bomb to "new and better things." He condemns critics in the scientific community who find fault

with "Star Wars" research. "One cannot work on military research without a positive attitude," he says. But when asked what such research would accomplish, he couldn't think of anything more promising to say than that it would force the Russians to increase their expenditures greatly. "If that happens, we would have accomplished something."[4] (Teller said nothing about what it would do to the U.S. economy, or whether, in trying to drive the Russians to economic ruin, the U.S. might not be cutting off its own nose to spite its face.)

The true cost would not be $10 billion a year, but more like $100 to $500 billion, and possibly, by the time they are in place, well over a trillion!

Opponents Argue Ineffectiveness, Technical Obstacles, Costs and Danger of War

Opposing the weaponization of space are many military, scientific and arms control experts, including members of the Union of Concerned Scientists, The Center for Defense Information, The Institute for Space and Security Studies; Dr. Hans Bethe - a nobel laureate and physicist who worked on the Manhattan project; Drs. George Rathjens, Kosta Tsipis and Jack Ruina of M.I.T.; Drs. Sidney Drell and Wolfgang Panofsky -Stanford physicists; Dr. John Steinbrunner, head of international relations at the Brookings Institution in Washington; Richard L. Garwin of Harvard, and many others. The reasons for their opposition vary from practical, technical problems to cost factors and strategic security considerations. Directly contradicting and contesting the claims of the space weapons advocates, they argue that:

1. The true cost would not be $10 billion a year, but

more like $100 to $500 billion,[19] and possibly, by the time they are in place, well over a trillion![20] The effects on the economy would be devastating. While federal deficit soared out of sight, human needs would go unmet.

2. The development of space weapons will undermine the peaceful uses of space, threatening communications systems, etc.

3. There are too many technical problems. Richard D. DeLauer, U.S. Undersecretary of Defense for research acknowledged in Congressional testimony that directed energy weapons posed eight serious technical problems, *each* of which would involve "staggering costs" to remedy and require a mobilization of science and engineers as great or greater than that required to land men on the moon.[21]

4. These systems would not be an effective *defense*. All of the various space weapons proposals have serious *vulnerabilities*. For example, says Bowman, "none of them could survive a single nuclear explosion in space. The radiation and electromagnetic pulse from a single blast could wipe out the sensitive electronic brains of hundreds of battle stations, clearing the way for a following wave of ICBM's."[22]

5. Furthermore, says the ISSS, any defensive capabilities that might be perfected, could be bypassed effectively by *countermeasures*. Every new weapon system developed by the United States has eventually been matched by a Soviet counterpart. The U.S. has already identified several countermeasures against the High Frontier system. As Dr. Bowman notes, if the U.S. can think up countermeasures, "the Soviets are smart enough to think of them too." For example, in the 10 to 20 years it would take the U.S. to deploy the system, the Soviets could "go to depressed-trajectory systems which travel beneath the system's coverage, to shift to cruise missiles, which are impervious to any space-based

defense, or to merely multiply the number of offensive missiles so as to overwhelm the defense."[23] As far as any real *defense* value, weaponizing space leads to a dead end.

...the rationale that these systems will bring an end to policies of nuclear deterrence, Mutual Assured Destruction and nuclear-war-fighting is simply not true.

---

6. These systems will not bring an end to the threat of Mutual Assured Destruction, but are more likely to activate it. Many of the proposed space defense systems, such as General Graham's "High Frontier," in actuality are not aimed at protecting *people* in the case of a nuclear attack, but rather U.S. nuclear missile silos! The only purpose for this can be to preserve the capacity for nuclear retaliation. Thus the rationale that these systems will bring an end to policies of nuclear deterrence, Mutual Assured Destruction and nuclear-war-fighting is simply not true.[24] The fact should not be ignored that the very people who argue for the development of "Star Wars" defense systems by claiming these weapons do not kill people, are the same ones who invariably support the MX, Pershing II, Trident II, and other offensive weapons, all of which *do* kill people.[25]

7. While scientists are skeptical about the *defensive* reliability of the proposed space systems, they point out their potential for offensive use as part of a *first strike*. For example, a first-strike strategy could conceivably include an initial attack on a nation's strategic satellite communications, verification, navigation and other information systems, followed by an attack on strategic missile silos. This would make retaliation difficult and give a decided "advantage" to the nation striking first.

Because one of "the commonly acknowledged shortcomings of space-based defenses is their inability to handle large numbers of targets in a massive first strike," most analysts feel that a large number of nuclear missiles would get through on a first strike. However, the space-defense is likely to be more effective against a small number of missiles. "If this is so, such a system would be of little protection against an enemy first strike, but might be very useful in mopping up the few retaliatory missiles remaining after a first strike by the side possessing the defensive. system."[26] In such a case, it is not that nuclear deterrence becomes *unnecessary*, as General Graham has stated, but that it may be rendered *inoperative*. The nation with space weapons in place first might not be deterred from a nuclear attack.

Most space weapons systems presently being discussed would violate existing arms control treaties.

---

8. Most space weapons systems presently being discussed would *violate existing arms control treaties*. Furthermore, they would *threaten the satellite verification systems* upon which existing arms control treaties depend. The end result would not be greater national security, but greater *insecurity* as U.S.-Soviet relations further deteriorated, and as an already fragile system of international law was further weakened. The resulting state of near anarchy at the international level could lead to war.

9. Finally, *the hair trigger responses* of these systems make them especially dangerous. If both superpowers deploy them "each side's systems could destroy those of the opponent in a fraction of a second." As the ISSS report states, "hair trigger" response would take on a whole new meaning when engagements take place

at the speed of light. Not only would the temptation to shoot first in order to leave the opponent defenseless be enormous, but a false indication of an attack against one side's ABMs would necessarily trigger an automatic and immediate response, leading to a full scale nuclear exchange.

...''hair trigger'' response would take on a whole new meaning when engagements take place at the speed of light.

The Real Objective?

Perhaps the best testimony about the real objectives of space weaponization proposals comes from some of their advocates:

- *''Space is the new high ground of battle.''* -Lt. General Richard C. Henry, Deputy Commander of Air Force Space Command (ret.), 1983.[27]
- *''We do not have to stretch our imagination very far to see that the nation that controls space may control the world.''* -Edward C. Aldridge, Under-Secretary of the Air Force, 1983.[28]
- *''We should move into war-fighting capabilities - that is ground-to-space war-fighting capabilities, space-to-space, space-to-ground.''* -General Robert T. Marsh, Commander, Air Force Systems Command, 1982.[29]
- *''Armed with the detailed Heritage study...President Reagan would have the*

secret weapon needed to undercut the nuclear freeze crusade." Gregory A. Fossedal, special consultant for the Heritage Foundation's "High Frontier" project."

"Star Wars" - The Movie and Our Souls

Our youngest child was born the year astronauts planted an American flag on the moon. A few years later we were invaded on Halloween by hundreds of kids dressed as Luke Skywalker, Princess Leia, Darth Vader and R2-D2. By the time the first "Star Wars" film took possession of the public imagination, the penetration and militarization of space had been an accomplished fact that had bred its own form of fantasy about a future time when planets would be zapped out at the speed of light.

The hidden assumption of "Star Wars" ...was that long ago, in the barbaric, dark ages of the twentieth century, arms control and disarmament efforts had failed.

The hidden assumption of "Star Wars" - written as it was from the perspective of the far future - was that long ago, in the barbaric, dark ages of the twentieth century, arms control and disarmament efforts had failed. War had gotten bigger and better and more remotely controlled so that when a planet was "eliminated" no one had to hear the screams or see the blood and gore. There was only a momentary pause and pale regret for the lost planet before the action of Star Wars continued to its exciting climax of intergalactic warfare.

The film's unquestioning stance left me saddened. It seemed to me then that the film's failure to raise to a

conscious level the question about whether the history of the earth and space could not have gone in another direction if different choices had been made back in the twentieth century, testified in some way that the earth was already lost. In unquestioningly accepting and mentally preparing for star wars we were giving up on the earth and on ourselves and our children and great-great grandchildren.

...ultimately what we do in outer space will be a mirror image of our inner space, of the state of our souls.

We were giving up, too, on our own souls. For ultimately what we do in *outer* space will be a mirror image of our *inner* space, of the state of our souls. It will reflect whether or not we have learned to name and tame our capacity for violence and destructiveness and to enlarge our power and capacity for community, for healing, for creating, for loving. It will reflect whether we have succumbed to our Faustian fascination with the technology of destruction or whether we have learned to develop life-enhancing technology to accompany an enlargement of our spirit.

The succeeding two films in the Star Wars trilogy began to touch more on this relationship between inner space and outer space. Luke actively seeks to develop and direct his inner powers as a force for good in the universe. He retreats inward to search for identity and to develop spiritual mastery. At the end of his journey in *Return of the Jedi* when Luke is engaged in mortal combat with Darth Vader, there comes a redemptive awakening. Luke finally recognizes his intimate connectedness to his polar opposite, Darth Vader. This moment of insight into the truth of their connectedness is the gateway to healing, wholeness and peace of soul for both the son and the father. It is also the gateway to external peace - in this case,

peace in inter-galactic relations. But for many in the viewing audience, the subtle relationship between the resolution of the inner conflicts of the soul and the conflicts in outer space went largely unnoticed.

Questions at the Gateway to the Heavens

We are standing at the gateway to the heavens. But are we asking the right questions? We should be asking such questions as "What can outer space teach us about who we are, our relatedness to each other and how to live together on one earth?", or "What can it teach us about the cosmos, about the solar system, about our planet as a subsystem within the larger cosmo-system, about the origins of the universe and its ongoing genesis?" Can we learn something in space about what it means to be human? to be human community? to be planetary creatures? Can our sojourn into outer space help us learn how to resolve some of our critical problems on earth?

We are standing at the gateway to the heavens. But are we asking the right questions?

Instead of asking such questions, our leaders are poising to take us into battle competition for possession and control of yet another global commons. We have invested our struggle for identity, power and mastery in making greater and greater external territorial claims and ignored the inner territory of our minds and souls. Is it possible that our drive to possess, control and weaponize larger and larger spheres of the planet - and now outer space - is inversely proportionate to our inability to see, inhabit and master our inner space? Is it possible that when we fail to identify and acknowledge the existence of our own dark side, we project it outward - onto others and now into outer space? Is it also possible that when we fail

to see and own our dark side, we also limit our capacity to see and know ourselves as children of the light? To fully know ourselves as "blessed" and "graced" as it were, and able to be much more than we have yet become? While we have marched ahead to the tune of "progress," developing our technology and "know-how", there has been a tragic lag in another dimension of our development. We have not adequately explored our *inner space*, nor developed the moral maturity, wisdom or spiritual depth - nor the language - to think about and manage our new technological power in ways that will ensure our future survival and well-being on earth and open us to the fullness of the heavens and the fullness of ourselves.

The Banality of Evil: "We Cannot Think What We Are Doing"

At the end of World War II, the philosopher Hannah Arendt was an observer at the trials of Nazi war criminals. Later she wrote about the banality of evil. She had been surprised to see how ordinary those who commited atrocities looked. They looked like other ordinary human beings who loved their children, their dogs and fine music and art. They were ordinary people with extraordinary powers over life and death. They had extraordinary power, but their tragic flaw was that they had no mental or moral tools to think about what they were doing. Therefore they marched in blind obedience to the dictates of their political leader or to their technological obsessions.

In the prologue to her book, *The Human Condition*, Arendt reflected further on the dangers of the lag between technological development and our ability to think about what we are doing."

> The trouble concerns the fact that the "truths" of the modern scientific world view, though they can be demonstrated in

mathematical formulas and proved technologically, will no longer lend themselves to normal expression in speech and thought...We do not know whether this situation is final. But it could be that we, who are earth-bound creatures and have begun to act as though we were dwellers of the universe, will forever be unable to understand, that is to think and speak about the things which nevertheless we are able to do. In this case, it would be as though our brain, which constitutes the physical, material condition of our thoughts, were unable to follow what we do, so that from now on we would indeed need artificial machines to do our thinking and speaking. If it should turn out to be true that knowledge (in the modern sense of know-how) and thought have parted company for good, then we would indeed become the helpless slaves, not so much of our machines as of our know-how, thoughtless creatures at the mercy of every gadget which is technologically possible, no matter how murderous it is.

...it could be that we, who are earth-bound creatures and have begun to act as though we were dwellers of the universe, will forever be unable to understand, that is to think and speak about the things which nevertheless we are able to do. (Arendt)

Lest we think that these words, written in 1958, were directed only at events such as Hitlerian genocides or atomic bombs, and have no bearing on current proposals to develop a space "defense", let us be mindful

that Arendt begins her book by referring to the 1957 launching into space of the first man-made satellite."

> This event, second in importance to no other, not even to the the splitting of the atom, would have been greeted with unmitigated joy if it had not been for the uncomfortable military and political circumstances attending it.

Arendt is not down on science and technology. She rejoices in their triumphs - real and potential. Rather, the focus of her concern is the lack of words and a language to think about what we are doing, and the inability to think, discuss and make moral judgements about the applications of technology that results from this lack of language. What she mourns is the *reversal of contemplation and action:* that we "do" first and only contemplate *after* the "doing", or not at all, on the consequences of our actions."

> ...the sciences today have been forced to adopt a "language" of mathematical symbols which, though it was originally meant only as an abbreviation for spoken statements, now contains statements that in no way can be translated back into speech. The reason why it may be wise to distrust the political judgment of scientists *qua* scientists is not primarily their lack of "character" - that they did not refuse to develop atomic weapons -or their naivete -that they did not understand that once these weapons were developed they would be the last to be consulted about their use -but precisely the fact that *they move in a world where speech has lost its power*. And whatever men do or know or experience can make sense only to the extent that it can be spoken about. There may be truths beyond speech, and they may be of great relevance to man in the singular, that is, to man

> in so far as he is not a political being, whatever else he may be. Men in the plural, that is men in so far as they live and move and act in this world, can experience meaningfulness only because they can talk with and make sense to each other and to themselves. (emphasis added)

What I propose is very simple: it is nothing more than to think what we are doing. (Arendt)

Making sense: does it really make any sense to weaponize space when the hard evidence indicates nations will be no more secure, in fact even less secure, than they are now as a consequence? Does it make any real sense to proceed to spend billions of dollars on weapons systems that threaten to drive us closer, not further away from nuclear holocaust? Now, more than ever, we need to heed the words of Arendt[34]

> What I propose is very simple: it is nothing more than to think what we are doing.

The banality of the evil that may be perpetrated on the planet and ourselves in weaponizing space is that we may allow it to be done to us and in our name, not because it meets any security need that is real, but because those political and technological elites whom we have chosen or allowed to make decisions in the name of our security cannot "think what they are doing." And we may allow it because we, too, like the "good Germans," "cannot think what we are doing." As a consequence we may strike a Faustian bargain in which we sell the future of our children and grandchildren, along with true national and world security, for the sake of indulging our obsession with new weapons technologies and in blind obedience to "doing" whatever appears technologically "possible".

Who Owns the Earth? Who Owns the Stars?

Throughout human history societies have claimed possession of increasingly larger territories - from tribal lands to city-states and kingdoms to national territories. It was symptomatic of the European "Age of Discovery" (when it was learned to everyone's surprise that the world was not flat and that just around the world from them - in the neighborhood so to speak - were other lands, other waters, other human societies) that nations began to claim other parts of the planet (whole continents sometimes, along with all the inhabitants) as their national possession. Today, the superpowers claim "national spheres of interest" and send troops around the world to "protect" *their* spheres. Now, as we go into outer space, our national egos and will to power, along with our eyes for territorial expansion, have grown bigger than the planet.

Nations used to defend their borders from *within* their national borders. But gradually they moved their weapons into the global commons - the spheres that belonged to no country, and yet to all countries. We have gone into the ocean commons - on the waters and under the waters - carrying our technology of destruction. We have placed our weapons deep under the earth's crust. And we have borne them on airplanes around the planet, claiming the air space above us as our possession, our sphere. Never mind that as the earth turns and the winds move, the air breathed in Moscow and in Washington D.C. is the same air; the outer space in which both cities and all cities on the planet subsist is the same space. And now some are proposing to take our weapons and our national egos into space and claim it too as our possession. Tell me this. In taking possession of the earth, and now of outer space, in claiming it as *our* possession, who has thought of God? To whom does the earth belong? To whom the oceans? To whom outer space? Who speaks for God, the creator of this magnificence?

The First Frontier for Peace: A Ban On Space Weapons

There is still time. Space has been militarized. It has been prepared for the ultimate in warfare - a giant Fourth of July in the sky. But we are not there yet. We have not yet made the "high frontier" the new battleground. We can still preserve the high frontier as the first frontier for peace.

But if we are to make outer space the first frontier for peace, we need in the immediate future a comprehensive ban on all space weapons.

The 1967 Outer Space Treaty prohibits signatory States from orbiting or basing nuclear weapons or other weapons of mass destruction in space. But while the treaty was to prohibit warfare in space, it does not explicitly ban directed energy weapons such as lasers and particle beams, which are not technically considered weapons of mass destruction. (Nevertheless they have the capability of being used that way - for example they could be directed at nuclear power plants, chemical factories or dams. The resulting flooding or release of toxic chemicals or radiation could indirectly cause mass deaths.) Nor does the Outer Space Treaty ban land or air based anti-satellite weapons (ASATs).

But if we are to make outer space the first frontier for peace, we need in the immediate future a comprehensive ban on all space weapons.

The 1972 ABM Treaty does prohibit the development, testing and deployment of all ABM systems or components, so if President Reagan proceeds with his plans to test and develop spaceborne ABM systems ("Star Wars" weapons) *the United States would be in violation of this important treaty.* In the end, the further erosion of

international law, already very weak and in an incipient state of development, will be to the detriment of all people, including U.S. citizens. The U.S. would hardly be in a position to demand that other countries observe their treaty obligations, or be able to invoke international law to protect its own citizens when it so flagrantly ignores the law itself.

Neither the Outer space Treaty nor the ABM Treaty explicitly include ASATs. *That is why we need an ASAT Treaty.* There is an urgent need for an ASAT ban not only to protect communications and strategic satellites, but also to safeguard against disguised violations of the ABM Treaty. As Dr. Bowman has noted, since ASAT and ABM technologies are similar, ABM developments can and are being disguised as ASATs to get around the ABM Treaty."[33]

Thus, if we are to preserve space for peace, we need an immediate ban on ASATs and on *all* types of space weapons. The Soviet Union has already stated its desire to negotiate a ban on all space weapons. The next move is in the hands of the U.S.

Benefits of a Ban on Space Weapons

The Center for Defense Information outlines what could be gained from such a ban:[34]

> The benefits of a ban on space weapons would be enormous: preventing both superpowers from spending billions of dollars in a fruitless attempt to dominate space; allowing commercial, scientific and other civilian space programs to expand unhindered; assuring the security of satellites which help preserve peace by decreasing the chances of miscalculation and enhancing verification of arms control agreements. And a ban on space weapons

would prevent space from becoming another arena of conflict, yet another nuclear trip-wire.

It is the height of unrealism to expect that nations can go on...increasing arms expenditures and preparing to fight nuclear wars without great suffering being exacted,

---

A Deep Freeze

Bowman would go even further. He advocates including a ban on the development of space weapons as part of a grand package deal which he has dubbed *"Deep Freeze."*

> The objective of Deep Freeze is a comprehensive agreement ending development, production, and deployment of all strategic systems, all nuclear weapons, all delivery systems, all space weaponry, all directed energy weapons, all chemical weapons, and all biological weapons.

Some may accuse Bowman of being unrealistic. But he is one of the most truly realistic people I have read in this field. It is the height of unrealism to expect that nations can go on as they have been - increasing arms expenditures and preparing to fight nuclear wars - without great suffering being exacted, either in the form of ultimate economic collapse, or in the form of nuclear Armageddon. Implicit in Bowman's proposal is an understanding that utter realism and common sense

demand that we reverse our direction. As the old sage noted, "If we don't watch where we are going, we will end up where we are headed."

Bowman outlines some very concrete and feasible steps that could be taken right now towards a Deep Freeze.(See his article in this issue.) All of these steps would enhance, not endanger, national security. All that is missing is the political will. And even that could be forthcoming if the public wanted it badly enough and continued to increase political pressure.

But What About National Security?

We live today at the end of one era and the beginning of a new one. We have been moving rapidly from an age of national self-sufficiency to one of global interdependence. This is as true of the ways in which societies will now realize security as it is of other spheres of human activity.

The story of history is the story of ever widening circles of interdependence. We have moved from tribal interdependencies to kingdoms and city-states to national interdependencies. Each of these past transformations necessitated changes in security arrangements and new structures and systems to manage the conflicts, crises and opportunities produced by these new interdependencies.

We are now moving into an era of international or planetary interdependence. But in this new age we have not yet developed effective global or planetary security systems. Consequently, all nations are caught in a security vacuum. Vulnerable and unsure of the future, they grasp at old, dead strategies.

One of our greatest challenges today is to overcome this security lag and to develop effective world security policies and systems that can provide a practical framework for disarmament. For nations are not likely to disarm in a security vacuum.

In the past, nations based their security on the twin principles of national *sovereignty* and *territorial impenetrability*. But the explosive growth of global-scaled technologies and an interdependent world economy, as well as the advent of missiles, makes mockery of these traditional security policies.

The Star War proposals are a nostalgic attempt to regain impenetrability and sovereignty. But none of the current "Star Wars" proposals offer any realistic basis for believing national borders can be made impenetrable to an adversary's missile attack or another nation's economic decisions. Rather they lead down a dead end path that neither restores sovereignty and impenetrability nor leaves nations more secure. The superpowers could spend hundreds of billions of dollars on new space weapons and destroy themselves economically only to find that their basic reality had not changed. Bankrupt and still poised for mutual destruction, they would be even less secure than when they started.

The system of organized warfare is becoming increasingly dysfunctional as a means to assure national survival. The weapons we have invented to protect ourselves are too dangerous to use. They will destroy those whom they were designed to protect as well as those against whom they are aimed. They could render the planet uninhabitable.

Nations can no longer achieve security by behaving as if they were separable, individually acting atoms that can exist apart from other nations. They are now so economically and environmentally interdependent that to destroy another nation is to destroy one's own life line. Combined with weapons of mass-destruction escalating out of human control, this economic and environmental interdependence means no nation can now realize its own security apart from the security of another nations.

The age when nations could provide security for their citizens from *within* their territorial borders is dying. The

movement into the global commons to ensure security is indicative that military strategists have already realized and responded to this fact. But when they moved into the global commons they took with them the old strategies based on the unquestioned assumption of *national* self-sufficiency, domination and control. As a consequence, the efforts to achieve national security by going into the ocean and air commons has been no more successful than security efforts from within national boundaries. Unless we change our basic assumptions, efforts to achieve security in the outer space commons will also fail.

The most important step to national and world security now is a fundamental change of mind.

Changing Our Mind

As Einstein noted, the atom bomb changed everything but they way we think. The most important step to national and world security now is a fundamental change of mind.

The two superpowers - with their aligned states in NATO and the Warsaw Pact - have been basing security on an *unworkable premise.* Like Luke Skywalker and Darth Vader, they see themselves as polar opposites. Each believes it is the force for good and the other the force for evil. Each believes it can achieve its own security only through opposition to the other or at the expense of the other. But in a world of interdependent nations, this basic assumption is bound to lead to strategies in which no one will be secure. Like Luke Skywalker and Darth Vader, the two super powers need to discover at last, their intimate relatedness to each other. Else they will forever threaten mutual destruction.

National Security is Synonymous with World Security

In an interdependent world one nation will be secure only to the degree that all other nations are secure. The path to security in such a world is the path of *mutual* security. As articulated at length by Gerald Mische and me in an earlier work, "*national* security is now synonymous with *global security.*"[33]

Like Luke Skywalker and Darth Vader, the two super powers need to discover, at last, their intimate relatedness to each other. Else they will forever threaten mutual destruction.

A "Window of Opportunity"

We stand at a rare historical moment. History is offering leaders of both superpowers - and all of us - a momentous and unique opportunity for the bold, creative steps needed to move toward a world of greater peace and security. Much of the communications, technological and economic infrastructure for an international security system is in place. And people all over the world - fearful of nuclear annihilation and global economic-monetary collapse - are increasingly ready for creative alternatives to the arms race. The hunger for true security transcends national, cultural and ideological boundaries.

This "window of opportunity" will not remain open forever. Many authorities claim that the arms race is almost out of human control. The complexities and fragmentation of modern military strategies - determined as they are more by weapons systems than by human sensibility about genuine security - have moved humankind into a qualitatively new era. It is an era that lacks guidelines and accountability; an era of

computerized weapons and warfare.

The question before us in this dangerous world is not whether nations need security, but *how*, in an increasingly interdependent world, we are going to realize it. The answer is not to be found in projecting old, obsolete worldviews out into space, but rather, from the vantage point of outer space, to learn to think about security on earth in new ways.

The question before us in this dangerous world is not whether nations need security, but how, in an increasingly interdependent world, we are going to realize it.

Lessons from Outer Space

As we journey out to the stars we need to learn its most fundamental lesson: The universe is not a system of divisible and separately acting atoms, but rather of interdependent, dynamically inter-acting parts. Space is not something that divides planets and solar systems, galaxies and constellations, but the place where the dynamic interaction, the bonding and communication between parts, goes on. Space is not a place where planets, solar systems and galaxies function individually and in isolation, but where they move in eternal relationship. Space is not emptiness, but a place of energy, creativity, and communion. It is not a place that can be possessed or owned or controlled. It is a place of discovery and becoming where the old separations and divisions are revealed as illusion.

If, on our sojourn into outer space, we are to learn the lessons it has for security on earth, we need to leave our weapons, our old worldviews and our old habit, war, behind. Most importantly we need to see space not as a new frontier for warfare, but as a new frontier for a sacred

journey - a journey into our own deepest essence. We must not allow that journey to be desacralized. And we must

---

As we journey out to the stars we need to learn its most fundamental lesson: The universe is not a system of divisible and separately acting atoms, but rather of interdependent, dynamically inter-acting parts.

---

not allow ourselves to be waylaid from that journey by a Faustian bargain in which we sell our nations, our earth, our souls for new weapons.

Repeat: What we do in outer space will be a mirror image of our inner space. It will reflect the state of our souls.

NOTES

1. The Institute defines itself as a not-for-profit organization devoted to research and education regarding space and high-technology areas vital to national security. It was founded in 1983 by Dr. R. M. Bowman.

2. "Space militarization Becoming Space Weaponization," an Issue Paper published by the Institute for Space and Security Studies.

3. Ibid.

4. Ibid.

5. "The Trouble With Star Wars," an Issue Paper published by the Institute for Space and Security Studies, p. 1.

6. Ibid.

7. See Bowman, "The Case Against Space Weapons," Institute for Space and Security Studies, January, 1983.

8. Union of Concerned Scientists, "The New Arms Race: Star War Weapons," Briefing Paper No. 5 (Oct., 1983.)

9. Bowman, "The Case Against Space Weapons," op.cit.

10. Bowman, Ibid.

11. Bowman, Ibid.

12. Bowman, Ibid. 13. Bowman, Ibid.

13. Bowman, Ibid.

14. President Reagan, in his televised address to the nation, March 23, 1983.

15. Daniel O. Graham in a letter to Archbishop William D. Borders dated November 2, 1982, in which he criticized some aspects of the draft of the U.S. Catholic Bishops peace pastoral and proposed consideration of space defense as an alternative to the policy of Mutual Assured Destruction.

16. As argued by Greg Fossedal, special consultant to The Heritage Foundation,in "Exploring the High Frontier: New Defense Option would Stifle Soviets, Help Chances for Peace," *Conservative Digest*, (June, 1982).

17. Fossedal, Ibid.

18. Edward Teller, as quoted in the New York Times article, "Reagan is Urged to Increase Research on Exotic Defenses Against Missiles," by Charles Mohr, Nov. 4, 1983.

19. In 1982 the Pentagon estimated that a "damage denial" system would cost about $500 billion. See Union of Concerned Scientists, "The New Arms Race.."op. cit.

20. See: "The Reality of "Star Wars" by Dr. Robert R. Bowman, Institute for Space and Security Studies; and "Militarizing the Last Frontier: the Space Weapons Race," in *The Defense Monitor*, (Vol. XII, Number 5, 1983.)

21. New York Times, "Group of Top Scientists Close to Government Fighting Space Weapons Plan," Nov. 16, 1983.

22. Bowman, "The Reality of Star Wars," op.cit., p. 5.

23. "The Trouble With Star Wars," op.cit., p.8.

24. See Bowman, "The Reality of Star Wars," op.cit.

25. ISSS, "The Trouble With Star Wars", op.cit., p.9.

26. "The Trouble With Star Wars," op.cit., p.8.

27. As quoted in *The Defense Monitor*, Vol. XIII, Number 5, 1983.

28. Ibid.

29. Ibid.

30. Fossedal, op.cit.

31. Hannah Arendt, *The Human Condition*, Chicago: The University of Chicago. Press, 1958.

32. Arendt, Ibid., p.1.

33. See Arendt's excellent chapter on "The Reversal of Contemplation and Action," Ibid., chapter 41, pages 289-294.

34. Arendt, Ibid, p. 5.

35. Robert R. Bowman, in notes to the author, June, 1984.

36. "Militarizing the Last Frontier: The Space Weapons Race," *The Defense Monitor*, (Vol. XII, No. 5, 1983).

37. Bowman, "The Case against Space Weapons," op. cit., p. 19

38. Gerald and Patricia Mische, *Toward A Human World Order: Beyond the National Security Straitjacket*, Paulist Press, 1977.

Space Weapons:

A Workable Defense

Or A Faustian Bargain?

Description and Assessment of ASAT and "Star Wars" Technology, With Proposals for a Ban on Space Weapons

by Patricia M. Mische

48

A variety of space weapons have been proposed or are currently being researched or tested by the U.S. These include:

1. anti-satellite systems (commonly referred to as ASATs);

2. various space-related anti-ballistic missile (ABM) or ballistic-missile defense (BMD) systems, (often referred to as "Star Wars" weapons.)

The "Star Wars" systems include directed energy weapons (lasers and particle beams), orbiting mirrors, and the multi-layered "High Frontier" plan, and are being advanced under the rubric of the "Strategic Defense Initiative" (SDI). ASATs are being researched and tested under another program with separate funding. However, while under separate programs, the two types of space weapons are related in that ASATs are a necessary *precursor* to the "Star Wars" ABM systems. They help develop the technology for SDI.

Proponents of these weapons systems claim they are for *defensive* purposes and that they are aimed at either destroying an opponent's strategic satellites (in the case of ASATs), or intercepting and destroying an opponent's launched missiles before they can reach their target (in the case of "Star Wars" BMD or ABM systems).

These weapons systems are being advocated in the name of saving people's lives in the case of a nuclear attack. Some advocates, such as President Reagan, claim that they will render nuclear weapons obsolete, replace the threat of Mutual Assured Destruction with a policy of pure defense and save us from a nuclear war. Such promises are very alluring.

What are these weapons? And are they capable of fulfilling these promises? Many scientific experts say no. Most of these weapons systems have enormous technical difficulties and costs that may never be overcome. Furthermore, even if the technical problems were resolved, there are grave doubts that these weapons could ever provide an effective defense against a nuclear attack. And most have offensive capabilities that tend to discredit claims that they will be used purely for defense. In fact, say the experts, they are more likely to be used as part of a first strike. And they are more likely to be effective in protecting nuclear missile silos than in saving people.

I. ANTI-SATELITE WEAPONS

Anti-satellite weapons (ASATs) are aimed at destroying an opponent's satellites. Satellites have strategic importance as the military's "eyes and ears." As Sedacca has noted, "they help relay instantaneous messages between national leaders and military forces around the world, provide early warning of missile attack, offer highly accurate navigational data, keep close watch on foreign military activities, gather intelligence and monitor compliance with arms control treaties."[1]

In other words, satellites are a critical component in deterring against an attack. The development of anti-satellite weapons by the superpowers will undermine their confidence in their ability to deter an attack. A nation planning a first strike would probably first attack its opponent's strategic satellite systems. And a nation that believed its satellites were at risk might be tempted to undertake a pre-emptive strike.

President Reagan justifies proceeding with U.S. ASAT tests on the grounds that the Soviet Union is ahead and that U.S satellites are in jeopardy. But according to the Institute for Space and Security Studies (ISSS), the United States had the first ASAT system, based on

ground-launched nuclear tipped missiles, and is ahead in development of an operational system.[2] As Robert Bowman has noted:[3]

> "The U.S....had an operational system from 1963 to 1975. The Soviets started much later, and *still* haven't got a truly *operational* system. The U.S. has begun calling it operational, but that hasn't changed reality. In 1979, AF Chief of Staff, General Allen, testified that the Soviet ASAT could not be called operational because it's testing program was insufficient. What has changed since then? They have had 4 more tests, 3 of which failed.!"

The United States stopped testing this first ASAT system with the advent of the limited test ban treaty and scrapped it in 1975, "not because it was ineffective, but because it was too effective, destroying any satellite within thousands of miles, whether friend or foe."[4] With the U.S.'s own satellites in jeopardy from its own ASATs, the U.S. "adopted the position that its national security would be best served by abstaining from competition in ASAT weaponry."[5] In the late 70's the U.S. began to seek a treaty banning ASATs. But at the same time, in a dual approach, the Air Force began developing an advanced non-nuclear satellite interceptor as a hedge against the possible failure of the treaty negotiations. "The Carter Administration then walked out on the ASAT negotiations at the time of Afghanistan and the U.S. has refused to resume them since."[6]

Meanwhile, the Soviet Union began sporadic testing of a rather primitive, clumsy ASAT system that can attack objects in *low earth orbits*. According to the Union of Concerned Scientists, the Soviet ASAT interceptor "uses a non-nuclear warhead to destroy its target with shrapnel. The highest altitude it can reach is

reported to be about 1,400 miles, threatening (only) low-orbit space objects." This does not yet represent a real threat to the U.S. since most U.S. strategic satellites are beyond reach in high orbit. Furthermore, out of 20 Soviet ASAT tests since 1968, about one half have been failures. The U.S. ASATs being tested now, however, do represent a real threat to the U.S.S.R. since most Soviet satellites are in low orbit.[7]

The Institute for Space and Security Studies also stresses this point.

> It should be emphasized that even if the Soviet system were to work, it could not threaten any of our critical strategic warning or communication systems, which are in orbits 15 times further from earth than the maximum range of the Soviet ASAT. In labeling the Soviet system "operational", the United States government seems to be once again overstating the "Soviet threat".

It is interesting to note the way in which language is used to lead the public to believe that "their" ASATs are a threat while "ours" are benign or even holy. U.S. strategists commonly refer to Soviet ASATs as "killer satellites" and U.S. ASATs as SAINTS.

In "response" to this Soviet "threat", the U.S. has been preparing to test a more advanced ASAT system launched at high altitude by an F-15 fighter aircraft. So far the U.S. has test launched a two stage rocket designed to carry an anti-satellite weapon, but no actual weapon has yet been launched. (As of this writing, however, a U.S. ASAT weapon is scheduled to be test launched in November, 1984.) According to the ISSS:[8]

This system is a "direct ascent" weapon which

> can strike from anywhere in the world and destroy target satellites in a wide variety of orbits. It kills by direct impact, without having to maneuver into a co-orbit, and gives little or no warning.... There is little doubt that if it is tested and deployed, the Soviets will "respond" in turn and a full-fledged ASAT race will be on. This will have the net result of decreasing the security of both participants.

It is interesting to note the way in which language is used to lead the public to believe that "their" ASATs are a threat while "ours" are benign or even holy.

The ISSS believes ASAT development will reinforce nuclear war-fighting policy.

> The official administration position is that we must have an ASAT in order to deter the Soviets from using theirs. Privately, Pentagon planners admit that our ASAT is viewed more as a war-fighting weapon. Once nuclear war has begun, they want the ability to knock out Soviet radar and electronic intelligence satellites(RORSAT's and EORSAT's).

The same ISSS report warns that the U.S. may be

> "taking too lightly steps that the Soviets would be likely to take should the U.S. accelerate the ASAT race. A second generation Soviet system could well pose a serious threat to critical U.S. systems, so it would seem to be in the interest of the United States to end the race where it is, with neither side being seriously threatened."

Proposals To Ban ASATs

At present, both sides would have a great deal to gain by a ban against further ASAT development. But the U.S. may have the most to gain from such a ban because its many military bases around the world rely on satellites for 70 percent of their long-haul communications whereas the Soviet Union, with its bases located primarily on the Eurasian land mass, is not so heavily reliant on satellites.[9]

...the U.S. may have the most to gain from such a ban...

In August, 1981, the USSR submitted a draft treaty to the UN calling for a "prohibition on the stationing of weapons of any kind in space." But the Reagan Administration refused to respond and instead, in 1983, began testing ASATs.[10] Brezhnev and Andropov both repeated offers to dismantle their ASAT system in exchange for a total ban on weapons in space.

Soviet Unilateral Moratorium

On August 18, 1983, the Soviet Union officially declared a unilateral moratorium on ASAT tests, to last for as long as the U.S. did likewise. (Unofficially the Soviets had already ceased testing ASATs a year earlier.) In June, 1984, the Soviet leader, Konstantin U. Chernenko, again invited the United States to join the Soviet Union in negotiating a joint ban on anti-satellite and other space weapons. "Agreement on these questions must be sought without delay," he said, "while space weapons have not yet been deployed and while a breakthrough in the race of space weapons, unpredictable for its consequences, has not yet been made." He also reiterated Andropov's pledge that the

Soviet Union would continue its unilateral moratorium on ASAT testing as long as the U.S. did likewise. Chernenko pledged that this Soviet freeze on testing would be only a first step toward the "total prohibition of anti-satellite weapons, including the liquidation of systems already in existence."[11]

On August 18, 1983, the Soviet Union officially declared a unilateral moratorium on ASAT tests, to last for as long as the U.S. did likewise.

The Soviets have observed their moratorium on ASAT testing for two years now. But, as noted above, the continuation of this moratorium is contingent on the U.S. doing likewise. Recent U.S. ASAT tests have brought us terribly close to violating this contingency. Although no actual weapon was carried, the testing was clearly a breach of the spirit of the Soviet offer. The schedule test of an advanced ASAT weapon in November would be a definite violation. If that happens, the Soviets are bound to break their moratorium and proceed to develop advanced ASATs of their own. Once this happens it will become almost impossible to secure a verifiable treaty protecting space systems from attack.

According to Robert Bowman[12]

> The Administration is playing "Russian roulette" with our national survival. By thus rejecting Andropov's testing moratorium, they have shown contempt for the whole arms control process and for the clear wishes of Congress. By putting our vital space systems at risk in a Quixotic attempt to achieve military advantage, this Administration is jeopardizing our national security...We have spent years reaching arms control agreements to limit

> destabilizing systems. These are now being abandoned. Both our military services and our arms control establishment are being desecrated, as preservation of peace is sacrificed in favor of preparation for war.

The Tsongas Amendment

In response to the Soviet offers, and in an effort to curb President Reagan's determination to proceed in the testing of ASATs, the U.S. Congress passed the Tsongas (D-MA) Amendment to the 1984 Defense Authorization Bill. This Amendment prohibits the expending of funds appropriated for ASAT testing unless the President can certify to Congress:

> (a) that the United States is endeavoring, in good faith, to negotiate with the Soviet Union a mutual and verifiable ban on anti-satellite weapons; and
>
> (b) that, pending agreement on such a ban, testing of explosive or inert anti-satellite warheads against objects in space by the United States is necessary to avert clear and irrevocable harm to the national security.

The Administration is playing "Russian roulette" with our national survival. (Bowman)

This amendment was also enacted to cover the 1985 Defense Authorization Bill and has caused a great deal of consternation for the Administration. Under President Reagan, testing of ASATs has proceeded, but not against space targets. In other words the tests up to now have been outside the restrictions of the Tsongas Amendment. But the ASAT test scheduled for Nov., 1984, which

would be against space targets, would violate this law. Because of this the Administration has been working frantically to find a way around the law. The method chosen has been to get the law changed.

The Administration has won Senate support for an amendment that would weaken the Tsongas Amendment. The Senate resolution would make it necessary only for the President to express his *willingness* to negotiate a treaty, and it provides that the President could seek a *limited* rather than a comprehensive ASAT ban. (One such limited ban being discussed would be to permit each side to have one ASAT option. Another limited ban being discussed is to allow only low orbit ASAT systems. Either way, this limited test ban would give the U.S. an advantage over the USSR because in the first case existing U.S. ASAT systems are more sophisticated and highly developed than Soviet systems, and, in the second case, as mentioned above, most U.S. strategic satellite systems are out of reach in high orbit, while most Soviet strategic satellites are in low orbit, not out of reach of U.S. low orbit systems.

Because ASATs are a precursor and necessary to development of the ABM "Star Wars" systems, it is also possible that the fate of these amendments may also determine the fate of space.

In contrast, a House measure known as the Brown amendment would strengthen the Tsongas Amendment by making it necessary not only for the President to certify the above two conditions before testing ASATs against space targets, but would *also* make it necessary for the Soviets to have broken their moratorium on ASAT tests before the U.S. could proceed in its tests. In

other words, it would mandate a U.S. moratorium parallel to the Soviet moratorium. The conflicting amendments will have to be hammered out in Congress. Whichever one wins, the decision will be key in determining the future of ASAT development. Because ASATs are a precursor and necessary to development of the ABM "Star Wars" systems, it is possible that the fate of these amendments may also determine the fate of space.

II. "STAR WARS" ABM SYSTEMS

The "Star Wars" systems have as their purpose the interception of an opponent's ballistic missiles before they reach their target. Existing plans include research on directed energy transfer systems (such as lasers and particle beams), orbiting mirrors and the multi-layered "High Frontier" proposal.

DIRECTED ENERGY TRANSFER (DET) WEAPONS

Weapons in this group include various forms of high energy lasers and particle beams. The feature that makes them prime candidates for use as space weapons is that they have the potential to inflict damage on distant targets at or near the speed of light. Energy is concentrated and transferred from a source to a target. Thus the name, Directed Energy Transfer (DET) weapons. But the more appropriate name might be Directed Energy And Destruction. In this case the acronym would be DEAD.

A. High Energy Lasers (HEL)

The word laser is an acronym for "light amplification by stimulated emission of radiation." A laser is a device that can accumulate energy, concentrate it into an extremely powerful beam (composed of a

single wavelength of radiation) and direct it with great precision at an object. There are many types of laser devices and different forms of beams. A beam can take the form of visible light or invisible radiation, such as X-rays or infrared radiation.

Low and moderate energy lasers are now used beneficially in medicine, industry and communications. They are also now being used militarily for rangefinding and target designation.

the acronym is HEL

High energy lasers (the acronym is HEL), however, have the potential for use as weapons. Lasers can concentrate extreme heat on an object, burning a hole at the point of contact. High energy lasers are being explored for use in an anti-missile defense. If perfected, they would be used to intercept and damage ICBMs during the boost phase (the first few minutes after launching, when a missile is most vulnerable.) In this phase the rocket engine is still burning and heat-seeking, infrared sensors can detect and track the hot exhaust, and the missile could theoretically be destroyed well before it reached its target. (In the subsequent and cooler "coast" phase, missiles are more difficult to detect. In the "terminal" phase, when the nuclear warheads are released and directed toward their multiple, individual targets, interception can be made by ground-based systems, but while this may protect hardened missile silos, it is too late to protect the human population.)[13] Besides the theoretical potential for intercepting missiles in the early stage of their trajectory, what makes lasers attractive to some defense strategists is that they could reach their target 50,000 times faster than a rocket interceptor.

Weapon-strength lasers require a much higher input of energy than low-energy lasers. Two energy

sources being tried are highly reactive *chemicals* and small *nuclear explosions.*

1. Chemical Lasers

Chemical lasers are being researched and developed under the auspices of the The Defense Advanced Research Projects Agency (DARPA). The objective of DARPA is to explore high-risk, high-payoff technologies and demonstrate basic feasibility, so that the military services can then develop operational systems based on the proven technology. In this case the military objective is an operational space-based battle station that would utilize chemical lasers and very large, lightweight mirrors to focus and aim the lasers. These battle stations would be placed in orbit via the space shuttle.

X-ray lasers would be powered by small nuclear blasts. They have been proposed by Dr. Edward Teller, head of the team that developed the hydrogen bomb...

According to the Union of Concerned Scientists "dozens, perhaps hundreds, of these orbiting battle stations would have to be placed into space to ensure that enough of them were strategically positioned at all times to target Soviet ICBM fields."[14]

2. X-Ray Lasers(Excalibur)

X-ray lasers would be powered by small nuclear blasts. They have been proposed by Dr. Edward Teller, head of the team that developed the hydrogen bomb, and are being researched under the code name "Excalibur" at the Lawrence Livermore National

Laboratory. The Union of Concerned Scientists'[3] describes the process involved in this type of laser weapon:

> When a nuclear device is detonated, massive quantities of X-rays are produced. Scientists working on Excalibur are trying to harnass these "clouds" of X-rays for the purpose of attacking enemy ICBMs. They believe this could be done by "pumping" the X-rays through lasing rods to produce focused X-ray energy beams. If these beams were produced in space, they could, theoretically, be targeted against Soviet missiles in flight. With the aid of heat-seeking sensors, the long spoke-like arms of the satellite would send a pulse of X-rays toward the missiles, which would be destroyed by the shock waves created by the laser pulses.
>
> The proponents of Excalibur call for a "pop up" deployment scheme. When an enemy missile attack appeared imminent, the U.S. would launch dozens -perhaps hundreds - of X-ray laser battle stations into space atop missile boosters. Each U.S. battle station would track rising Russian ICBMs with its 40-50 laser rods. This tracking would be done with information gathered by U.S. military satellites. The sensor equipment would have to distinguish real missiles from decoys, and transmit the data to ground stations for processing. Ground-based computers would make an immense number of calculations needed to plot the soviet ICBM flight trajectories, and would transmit that information back to the computers on board the battle stations. When the laser turrets were all aligned,

> the command would be given, the nuclear device in each weapon would explode, and the X-ray beams would deliver crippling blows to their targets. After this occured, the battle stations would themselves be destroyed by the nuclear blasts.

3. Orbiting Mirrors

Related to the use of lasers is another proposal that "envisages enormous mirrors placed in space to target and focus laser beams generated on the ground." the Union of Concerned Scientists describes the technology thus:[14]

> Such mirrors would be stationed permanently in orbit, or "popped up" (as with Excalibur) upon warning of an attack. As many as 100 ground-based laser stations would be dispersed across the continental United States. When a command to attack was given, the mirrors would be aimed, the laser beams would be transmitted into space and bounced off the mirrors to intercept the enemy ICBMs

B. Particle Beams

Particle beams are another type of directed energy weapon. They differ from lasers in that they are composed of intensely radioactive atomic or subatomic particles rather than light waves. Like lasers particle beams would theoretically be used for the interception of ballistic missiles in the boost phase. But while lasers work better in space, particle beams would work better in the atmosphere.

Charged particle beams (CPBs) are composed of particles, such as electrons and protons, that have been accelerated in a particle accelerator to nearly the speed of light. The charged particles are then directed in a

narrow beam at a target, which is hit with an intensive dose of radiation. Charged particle beams are being considered for ground-based systems. They are not appropriate for use in space because "the repulsive force between charged particles causes the beam to spread rapidly in the vacuum of space."[17] The beams are also subject to being bent by the earth's constantly

---

Those who advocate particle beam weapons envision deploying them similarly to proposals for deploying lasers. That is they would be fashioned into orbiting battle stations.

---

changing magnetic field.[18] For this reason, beams composed of *neutral* particles, such as neutrons, are being considered for use in space against targets above the atmosphere. These neutral particle beams, however, are much harder to generate and to focus and control.[19]

Those who advocate particle beam weapons envision deploying them similarly to proposals for deploying lasers. That is they would be fashioned into orbiting battle stations.[20]

Offensive Uses of DETs

While the stated purpose of directed energy transfer weapons is for defense against a nuclear missile attack, both lasers and particle beams have potential offensive applications. They could be used to strike a wide range of targets - military or civilian - with great precision. Communication systems, bridges, dams, rail lines and other vital elements of national and international infrastructure could be targeted. Theoretically DETs are not weapons of mass destruction since they would destroy only that which they actually hit, with

"minimum collateral damage." ("Collateral damage" is a military euphemism meaning damage beyond the actual targeted damage. Civilian deaths from radiation exposure in a nuclear attack, or the destruction of surrounding civilian buildings in an explosion aimed at a military installation would be examples of "collateral damage.") But this could be contested since a high energy laser could be used to bore a hole in a dam, causing it to crumble and flood the surrounding area,

---

...particle beams "directed at the earth from space would produce secondary radiation potentially as devastating as that from a nuclear attack - without warning.

---

leading to mass deaths. Or a petroleum or chemical factory could be struck producing combustion or explosions that affected people and buildings in the vicinity. High energy lasers could also be beamed with precision at nuclear reactors in power plants. There is also the radiation involved in both x-ray lasers and particle beams. According to the Institute for Space and Security Studies, particle beams "directed at the earth from space would produce secondary radiation potentially as devastating as that from a nuclear attack -without warning."[21] All of these examples underscore the potential inhumane aspects of these weapons and their capacity to produce mass deaths.

III. THE "HIGH FRONTIER"

The "High Frontier" is a multi-layered-defense proposal that is being promoted by the Heritage Foundation and Lt. Gen. Daniel O. Graham (Ret.). The *first layer* would be a spaceborne defense to "filter a Soviet missile attack in the early stages of flight."[22] This

"filter" would consist of 432 orbiting battle stations (killer satellites), each armed with 40-50 non-nuclear kill devices. These devices would be "equipped with infrared sensors to home in on Soviet missiles and destroy them by direct collisions."[23]

As far as *defense* goes, "sieve" might be more accurate than "filter", for a *second layer* is needed to intercept the missiles that are expected to make it through this first layer. This second layer would also be spaceborne and would utilize directed energy weaponry. This second layer is aimed at further "thinning out" a possible nuclear missile attack, but like the "filter" is not expected to be totally foolproof, for the plan calls for a third layer of defense on the ground.

This *third*, ground-based system would have as its function the protection of the U.S. missile silos (to safeguard the capacity for nuclear retaliation) and the interception of the Soviet missiles which have "leaked" through the space defenses.

A passive *fourth layer* of civil defense (citizen evacuation) would be implemented if the above three layers failed.

Proponents of this system claim that it would eliminate the threat of Mutual Assured Destruction and the need for nuclear deterrence. But the anticipated "leaks" in the system and the explicit goal of protecting the retaliatory capacity of nuclear missile silos would appear to belie this claim. Furthermore, the fact that 'leaks' are anticipated already discredits this plan's effectiveness.

Proponents of the High Frontier claim that the U.S. could "accomplish all this within five years using existing technology, at a total cost to the tax-payer of only $10 billion dollars a year."[24] But, as is described below and in the accompanying article, many experts reject such claims as misleading and false.

WILL "STAR WARS" SYSTEMS DEFEND?

What makes space weapons alluring to some is their theoretical capability to defend against a nuclear missile attack. But would these systems really work? According to some scientific critics, none of the "Star Wars" systems has yet been proved workable. The June, 1984, successful interception of a dummy reentry vehicle by a U.S. Army experimental missile was not part of the SDI "Star Wars" program. If anything it proves that "Star Wars" is unnecessary. According to Dr. Bowman, "the Army program is a relatively near-term development in search of a practical ground-based point defense," and not a space system. Unlike the Army program, the Strategic Defense Initiative (SDI) "Star Wars" systems face enormous technical hurdles, and the technologies to make them work may *never* exist. The following are only a few of the technical obstacles cited by experts:

- "For laser weapons to be effective against ICBMs, they would require targeting capabilities far beyond anything ever accomplished. The lasers would have to maintain near-perfect accuracy long enough to inflict damage upon targets traveling at more than 10,000 miles per hour, up to 3,500 miles away."[23]

- "While the pointing and tracking problem for any of the proposed systems is awesome, for lasers it is complicated by the requirement not only to hit the target, but to maintain a direct hit on the same spot until it burns through. The angular accuracy required is like hitting a nickel thrown in the air fifteen miles away - and, of course, the "nickel" is moving perhaps 15,000 miles an hour. This exercise is complicated by the need to repoint and fire at a new target every few seconds and by the fact that the extremely

delicate mechanism is sitting on a chemical laser whose vibrations are similar to those of a huge jet engine."[26]

- "A successful anti-ballistic missile defense would require immense battle management capabilities. Hundreds of space weapons, each capable of delivering hundreds of energy beams or non-nuclear kill devices, would have to be aimed at some 1,000 targets in the course of only five to eight minutes. (After this short period, the enemy missiles would begin releasing their multiple warheads and the number of targets would increase by a factor of up to ten.) Computers capable of accomplishing this sort of massive, instantaneous data processing do not exist."[27]

Hundreds of space weapons, each capable of delivering hundreds of energy beams or non-nuclear kill devices, would have to be aimed at some 1,000 targets in the course of only five to eight minutes.

- "The computer brain of the laser battle station must not only control the sensing of the targets and the pointing and tracking of the beam and the mirror producing it, but must sense when the target has been burned through so that the beam can be moved to a new target. It must determine the best order in which to attack the hundreds of targets and must coordinate with other battle stations so they don't go after the same missiles. The computer and associated electronics is the most vulnerable part of the laser battle station, and could be wiped out by a single nuclear explosion thousands of miles away."[28]

- The *countermeasures* that could be used to render lasers ineffective are numerous. "For example, the target ICBM can spin, distributing the laser energy in a band around its surface" (and thereby preventing damaging penetration.) "It can be coated with ablative material or with a mirror-like surface to reflect away the laser energy, or it can eject a cloud of gas or liquid from its nose to screen it from the laser."[29]
- "No mirror ever built comes close to meeting the requirements necessary for an ABM laser weapon. The mirror might have to be 40 to 50 feet across, whereas the largest laser mirror built to date is less than six feet in diameter. The mirror would have to withstand enormous temperature changes. Anything short of perfect reflection would result in destruction of the mirror by the laser itself."[30]
- "It wouldn't take a very exotic ASAT to put an orbiting mirror out of commission. A bucket of sand or even a cloud of water vapor would do it -anything that would spoil or fog the mirror surface would turn the reflected laser beam into a harmless searchlight."[31]
- The X-ray (Excalibur) laser, which would be powered by nuclear explosions, is destroyed by the nuclear blast the first time it fires a shot. "If the attacker sends a single missile or anti-satellite (ASAT) weapon at an Excalibur battle station, it must destroy itself to defend itself.[32]
- "Particle beam ABMs would face additional obstacles. Building a particle accelerator small enough for deployment in space may not be possible. Finding a suitable energy supply for such a weapon will be difficult. The actual physics of particle beams, moreover, may not allow them to be aimed effectively in space."[33]

- "Technically (particle beams) look even less promising than lasers. Beams of charged particles, such as protons and electrons, have proved to be unsuitable for the space environment. The repulsive force between charged particles causes the beam to spread rapidly in the vacuum of space. Charged particles beams are also subject to being bent in a rather dramatic and unpredictable way by the earth's constantly changing magnetic field. Even hitting a target a million times the size of an ICBM could prove to be difficult."[60]

'We would have to delegate the decision-making to the weapon system itself and we have had no experience in that type of operational system.'

- "Since the ABM weapons would have only a few minutes to identify the target and execute an attack, human participation would be eliminated from the process. Automatic weapons would require an entirely new generation of "smart" technologies, machines with "artificial intelligence" capability to engage in a space warfare mission independently. As a research analyst for the U.S. Department of Defense has observed, *"We would have to delegate the decision-making to the weapon system itself and we have had no experience in that type of operational system."*"[61]
- The "High Frontier" proposal has another type of problem, particularly in its first-layer, spaceborne phase, where it "pays for its relative low-tech approach by being slow, short-range, and inflexible. Because the system, as proposed,

has gaps in its coverage. It might take about a thousand "High Frontier" battle stations to do any good. As this is the only one of the proposed systems that cannot strike with the speed of light, it is particularly vulnerable to a wide range of threats. Were it to be pitted in a space battle against any of the directed-energy systems, it would be like slingshots against machine guns."[36]

It would seem that proponents of "Star Wars" system are so enamored by new weapons technologies that they have laid aside the question of whether or not the new technologies will provide any real defense value.

A FAUSTIAN BARGAIN?

While the technical problems are formidable, it may be that in this area, as in other technological undertakings of the past, some of the problems would be resolved. With enough time and at great economic sacrifice, workable weapons might be placed in space. What then? Will the nation be more secure? Or would the Soviets by then also have found solutions to the technical obstacles and placed their own weapons in space? And would they not also have developed effective countermeasures to render these new weapons systems useless? And if the nation will not be more secure, then why should it proceed to risk economic ruin for the sake of useless weapons?

It would seem that proponents of "Star Wars" systems are so enamored by new weapons technologies that they have laid aside the question of whether or not the new technologies will provide any *real* defense value.

Dr. Robert Bowman of the Institute for Space and Security Studies claims that the SDI (Strategic Defense Initiative) "has no legitimate objective and, in fact, betrays the promise of President Reagan's "Star Wars" speech of March 23, 1983."[7] In an article entitled, "Ballistic Missile Defense: A Strategic Issue,"[8] Bowman writes:

> The President asked for a system that would render nuclear weapons "impotent and obsolete". He asked the question, "Wouldn't it be better to save lives, rather than avenge them?". He proposed a policy of pure defense to replace deterrance through the threat of retaliation. Indeed, he acknowledged that such defenses, if combined with offensive weapons, would be threatening and destabilizing. Clearly, he was talking about the kind of defensive system that would allow us (indeed *require* us) to discard our offensive weapons. This, of course, requires an essentially perfect defense against all kinds of nuclear weapons - something one study group after another, in and out of government, has

---

...It is wrong to ask the public to pay 26 billion for research toward a trillion dollar system to protect missile silos and let them think they are buying protection for people.

> declared to be impossible. It's obvious that the Pentagon has accepted the impossibility of such a scheme, and is charging off in a different direction. They are working on "Star Wars" defenses to be used *in conjunction with offensive weapons* for the purpose of

> "enhancing deterrance", not replacing it...
> ...*It is wrong to ask the public to pay 26 billion for research toward a trillion dollar system to protect missile silos and let them think they are buying protection for people.* You can either *replace* deterrance, or you can *enhance* it. You cannot do both. And SDI does *neither*! It actually greatly increases the likelihood of nuclear war, and it does nothing to lessen its devastation.

If we persist in our Faustian fascination with new weapons technology we may not only end up bargaining away the peaceful uses of space, but also any real chance for security and survival on earth.

A COMPREHENSIVE TREATY NEEDED AGAINST ALL SPACE WEAPONS

Clearly the time has come for a comprehensive ban on all space weapons - now, before these weapons are developed. Such a draft treaty has already been prepared. U.S. and Soviet space experts have already met and agreed on the wording for such a treaty." The treaty would prohibit all anti-satellite (ASAT) weapons and all space weapons in general. Combining elements of a draft developed by The Union of Concerned Scientists and of the Soviet draft treaty submitted to the United Nations in August, 1983, this draft treaty provides that all existing ASAT systems be destroyed. It also provides for strengthened verification procedures including both an international verification system and "national technical means" of verification. A draft treaty banning space weapons is available. Despite President Reagan's claims to the contrary, verification is possible. All we need now to achieve a total ban on weapons in space is the political will.

NOTES

1. Sandra Sedacca, "The Space Race Debate," in *Hotline*,(Common Cause Nuclear Arms Alert Network Newsletter), (Vol. 2, No. 1, March, 1984), p.5.
2. "Now is the Time to End the ASAT Threat," an Issue Paper of the Institute for Space and Security Studies.
3. Bowman, in notes to the author, June, 1984.
4. Institute for Space and Security Studies, "Now is the Time to End the ASAT Threat," op.cit. p. 2.
5. Union of Concerned Scientists, "The New Arms Race: Anti-Satellite Weapons," Briefing Paper No. 3, Sept., 1983.
6. "Now is the time to End the ASAT Threat," op. cit.
7. Union of Concerned Scientists, "The New Arms Race: Anti-Satellite Weapons," Briefing Paper No. 3, Sept., 1983.
8. 'Now is the time to end the ASAT Threat," op.cit., p.3.
9. Ibid.
10. Union of Concerned Scientists, " The New Arms Race: Anti-Satellite Weapons," Briefing Paper No. 3, (Sept., 1983.)
11. Chernenko's pledge was reported in the New York Times, June 12, 1984.
12. As quoted in "U.S. ASAT Risks Arms Race in Space," Institute for Space and Security Studies, (January 21, 1984).
13. See "The Trouble with Star Wars," an issue paper published by The Institute for Space and Security Studies, p. 2.
14. Union of Concerned Scientists, "The New Arms Race: Star Wars Weapons," Briefing Paper ' 5, (October, 1983.)
15. Ibid.
16. Ibid.
17. Bowman, "The Reality of Star Wars", op. cit., p. 3.
18. Ibid.
19. Ibid.
20. Union of Concerned Scientists, ".. Star Wars weapons," op. cit., p. 2.
21. "The Trouble With Star Wars," op. cit., p. 5.
22. " High Frontier Study: A Summary", High Frontier. Ptoject director, Lt. Gen. Daniel O. Graham, Washington D.C., 1982.
23. Union of Concerned Scientists, "The New Arms Race: Star Wars weapons," op.cit.
24. Fossedal, Ibid.
25. "Union of Concerned Scientists,...Star Wars Weapons," op.cit., p. 3.
26. "The Trouble With Star Wars," ISSS issue paper, op. cit., p. 3.
27. Union of concerned scientists, "...Star Wars weapons," op.cit., p. 3.
28. "The Trouble With Star Wars", op. cit. p. 3.
29. Ibid.
30. Union of Concerned Scientists, " ...star Wars Weapons," op.cit.
31. "The Trouble With Star Wars," op.cit., p. 4.
32. Ibid., p. 5.
33. Union of Concerned Scientists, "...Star Wars Weapons," op.cit., p. 3.
34. "The Trouble With Star Wars," op.cit. p. 5.
35. Union of concerned scientists, "...Star Wars Weapons", op.cit., p. 3.
36. "The Trouble With Star Wars", op.cit., p. 6.

37. News release from the Institute for Space and Security Studies, May 24, 1984.
38. An issue paper published by the Institute for Space and Security Studies, April, 1984.
39. The meeting, a round table Conference of Religious Leaders and Experts, on "Space Without Weapons," was held in Moscow, April 2-4, 1984. See ISS's report dated April 12, 1984.

Proposal For A Deep Freeze

by Dr. Robert M. Bowman

75

Dr. Robert M. Bowman is President of the Institute for Space and Security Studies. A 22-year veteran of the Air Force, Dr. Bowman was Director of Advanced Space Programs Development for what is now the Air Force Space Division. Later he was Manager, Vice President of Space Communications Company. In 1982 he founded the Institute for Space and Security Studies and has committed his energies to preserving the peaceful uses of space. For more information write to the Institute for Space and Security Studies, 7720 Mary Cassatt Drive, Potomac, MD, 20854.

The objective of a Deep Freeze is a comprehensive agreement ending development, production, and deployment of all strategic systems, all nuclear weapons, all delivery systems, all space weaponry, all directed energy weapons, all chemical weapons, and all biological weapons.

It would leave both the United States and the Soviet Union enormously powerful and closer to parity than they have ever been before. It would not end the dangers posed be existing armaments, but it would end the race toward an elusive superiority which neither side can achieve. It would ease fears generated by the introduction of new or improved strategic weapons. It would preserve the safety of our satellite warning systems and our national technical means of verification. It would provide needed breathing space for both sides to sit down

together to plan a way to eliminate the threat of nuclear and other strategic weapons. And it would free up resources - money, brainpower, technology, industrial capacity - which both sides could apply to solving the problems of its people and providing a better life for tham and people around the world. Deep Freeze would be the biggest possible single step toward the ultimate objective of total and complete disarmament.

The objective of a Deep Freeze is a comprehensive agreement ending development, production, and deployment of all strategic systems, all nuclear weapons, all delivery systems, all space weaponry, all directed energy weapons, all chemical weapons, and all biological weapons.

Some Concrete Steps to Consider Now

It may not be possible to obtain the objectives of Deep Freeze all at once in a single comprehensive agreement, although there are definite advantages in making the attempt. There are, however, several positive steps the United States could take without risk. The list which follows intermixes space weapons and nuclear weapons issues. Space systems may exist in a vacuum, but strategy does not.

(1) Ratify SALT II, which both we and the Soviets are abiding by anyway.[1]

(2) Announce a unilateral moratorium on the testing of ASAT weapons and on the deployment of any weapon in space, pending the outcome of negotiations.

(3) Invite the Soviet Union to participate in an early shuttle flight, launching a Soviet civil satellite, with a

Soviet cosmonaut as mission specialist. This would help alleviate Soviet fears of the shuttle as a weapons carrier.

(4) Accept the Soviet invitation[2] to discuss a ban on all weapons in space and all Anti-Satellite weapons.

(5) Announce a unilateral 6 month moratorium on the deployment of nuclear systems, extendable if appropriate reciprocal actions are taken.

(6) Invite the Soviet Union to join us in negotiations aimed at a freeze on the development, production, and deployment of nuclear weapons and delivery systems.

(7) Establish a panel of experts on verification to assist the Arms Control and Disarmament Agency to reach verifiable accords.[3]

(8) Establish a U.S. Peace Academy[4] with the charter to investigate innovative ways to bring the world closer to realization of a secure, just and lasting peace.

(9) Charge the Department of Defense with a comprehensive re-analysis of strategic doctrine, aimed at replacing unrealistic concepts such as the winnable protracted nuclear war.

(10) Establish a panel to plan the conversion of the armaments industry and to propose specific international space and other high technology programs capable of providing global solutions to global problems and of revitalizing the consumer production capabilities of the United States.

(11) Invite the Soviet Union to join us in a joint engineering endeavor, similar to that preceding Apollo-Soyuz, to define joint missions for Shuttle and Salyut and

to propose common endeavors enhancing the security of both sides.

(12) Reestablish and expand cultural, scientific, and educational exchange programs between the United States and the Soviet Union.[5]

(13) Convene a summit meeting to promote better understanding between our countries at the highest level. A prime objective of such a meeting should be a joint declaration recognizing the fact that neither the United States nor the Soviet Union can be secure if the security of the other is unduly threatened and that national security and global security have become synonymous.[6]

NOTES

1. "A Freeze Can Be Verified", by Eugene J. Carroll, Jr., Rear Admiral, U.S. Navy (Ret.), *The New York Times*, June 3, 1982.

2. "Soviets Seek Pacts to Ban Space Arms", *Washington Times*, August 4, 1982. The best vehicle to accomplish this would be an augmentation of Article 4 of the Outer Space Treaty of 1967. The full title of the Outer Space Treaty is "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies." It was signed at Washington, London and Moscow on January 27, 1967, ratified by the U.S. (Senate advice April 25, 1967, Presidential signature May 24, 1967), and went into effect on October 10, 1967. A copy of the entire treaty was entered into the Congressional Record by Senator Pressler on September 24, 1982.

3. For insight into arms control treaty monitoring, as well as an excellent discussion of the Soviet performance on existing treaties, see "Soviet Compliance with SALT I", published by Center for Defense Information, Washington, D.C.

4. A proposal to establish a United States Peace Academy, originated by Senator Spark Matsunaga of Hawaii, has been co-sponsored by over half the members of the Senate. More information is available from Senator Matsunaga's office or from National Peace Academy Campaign, 110 Maryland Ave, NE, Suite 489. Washington, D.C. 20002.

5. The possibilities and importance of these programs is spelled out in "Seeking Security: Deterrence by Fear or by Friendship", FCNL Washington Newsletter No. 445, March 1982.

6. This subject was widely discussed at the conference entitled "Emerging Concepts of National and Planetary Security", U.S. Association of the Club of Rome, San Francisco, CA, November 5-7, 1982.

GLOBAL EDUCATION ASSOCIATES

Global Education Associates is a growing network of men and women in over 50 countries who collaborate across national, religious and occupational lines in common efforts to create a more human world order.

G.E.A. was founded in 1973 as a non-profit educational association. The associates conduct educational and research programs, publish educational materials and seek to catalyze a transcultural, multi-issue movement for a world order based on social and economic justice, peace, ecological balance and democratic participation. Toward that goal the Associates have conducted over 1000 workshops, institutes and seminars in Africa, Asia, Europe and North and South America.

Contributions to Global Education Associates are tax deductible. Contributors receive all GEA publications for a year.

For more information write
Global Education Associates
552 Park Avenue
East Orange, N.J. 07017

PUBLICATIONS and RESOURCES

THE WHOLE EARTH PAPERS — a series of monographs that examine the linkages between local and global concerns and explore alternative world futures.

BREAKTHROUGH — The Associates quarterly newsletter, features articles on world order and highlights relevant resources and reports on GEA network activities.

TOWARD A HUMAN WORLD ORDER — the book by Gerald and Patricia Mische that identifies our times as a period of major transformation and examines the National Security Straitjacket as it is impacting on human development. (Now available in Japanese and Chinese translations as well as English.) (Paulist Press, $4.00)

TOWARD A HUMAN WORLD ORDER — the filmstrip series based on the book by the Misches and produced by the Franciscan Communications Center.

GLOBAL EDUCATION RESOURCE GUIDE an annotated guide to global education books, audio visual materials and teaching aids on global issues. $4.00

THE WHOLE EARTH PAPERS

The Whole Earth Papers are monographs for reflection and action that examine the relationship between local and global concerns and explore alternative futures. These publications arise out of the worldwide programming and networking of Global Education Associates, and are tools for promoting a human world order.

Past Issues Available:

No. 1. **THE PEACE PARADIGM,** *by James Baines.* 60¢

No. 3. **HUNGER AND WORLD ORDER,** *by Miriam Therese MacGillis, O.P.* and *Gerald Mische* (Revised, New Edition). 70¢

No. 5. **VOICES FROM INDIA.** A special bound issue containing essays and reflections on peace, justice and alternative futures written by Indian authors. $2.00

No. 6. **WOMEN AND PEACE,** *by Josephine Rubin.* Traces the history of women's involvement in the peace and disarmament efforts in the late 19th century and early 20th centuries. 70¢

No. 8. **WOMEN AND WORLD ORDER,** *by Patricia Mische.* Explores the relationship between sexism drive for security. Shows links between arms control and disarmament goals and the realization of the goals of the U.N. Decade for Women. 60¢

No. 9. **WOMEN AND POWER,** *by Patricia Mische.* Examines the nature of power and the way women have historically related to it. Indicates the need for involvement of women and the integration of "feminine" values in the development of world order alternatives. 60¢

No. 10. **CHRISTIAN VOICES ON WORLD ORDER.** A special bound issue of The Whole Earth Papers that explores world order alternatives from biblical, theological and spiritual dimensions of Christianity. $2.50

No. 11. **THE CHILD AND WORLD ORDER,** *by Betty Reardon.* 70¢

No. 12. **EARTHSCAPE: TRANSITIONS TOWARD WORLD ORDER.** A special bound issue that provides a remarkable overview of the inner and outer dimensions of the global order rapidly emerging on our planet. $3.00

No. 13. **AGING AND WORLD ORDER,** *by Jim Baines.* Explores the impact of national security priorities on the status and well being of older adults, and their potential contribution to a more just, peaceful and viable world future. $1.00

No. 14. **SECURING THE HUMAN: JOURNEY TOWARD WORLD LAW AND JUSTICE.** A collection of articles that identifies criminal acts against humanity and challenges us to create in ourselves and in the global community the insights, moral sanctions, and legal structures necessary to secure the human against victimization and extinction. $3.00

No. 15. **CELEBRATION AND WORLD ORDER.** *by Mary Alban Bouchard,* celebrates the earth. $1.50

No. 16. **SPIRITUALITY AND WORLD ORDER.** An exploration by 10 authors of the inner, spiritual and psyuchological foundations for a more human world order. $3.00

No. 17. **LAND AND WORLD ORDER.** Special issue on how does the straitjacket of the national security affect land issues? $3.50

No. 18. **TERRORISM AND WORLD ORDER.** *by George Lopez.* $1.00

No. 19. **EARLY VICTIMS OF WORLD WAR III.** *by Rosalie Bertell.* 50¢

Patricia M. Mische, co-founder of Global Education Associates, is an author and worldwide speaker on global issues. Among her many other works are *Toward A Human World Order, Toward A Global Spirituality,* and *Women, Power and Alternative Futures.* The two essays in this volume are adapted from chapters in her forthcoming book on *Security Alternatives to the Arms Race.*

ABOUT THIS BOOK

Current proposals to weaponize space will violate existing arms control treaties and launch a whole new arms race. This volume is a response to that threat. It includes two essays by Patricia Mische:

1. "Star Wars" and the State of Our Souls:

2. Space Weapons: Workable Defense or Faustian Bargain?
   (A description and assessment of "Star War" and ASAT technologies and related proposals for arms control.)

Also included: A Proposal for a Deep Freeze on all space as well as nuclear, chemical and biological weapons, by Dr. Robert Bowman of the Institue for Space and Security Studies.

published by

Global Education Associates
552 Park Avenue
East Orange, N.J., 07017, USA
tel. 201-675-1409

$2.50
(Bulk rates available)